

[027] Fig. 1 is a top view of a measuring body with an inventive speed measuring system; [[and]]

[028] Fig.2 is a diagrammatic curve of a speed signal amplitude as a function of an air gap[[]], and

Fig. 3 is a top view of a measuring body of an inventive speed measuring system employing two speed sensors.

[031] A stationary speed sensor 4 located radially to the toothed disc 1 in this embodiment conventionally detects, for example, inductive, magneto-resistive or via a Hall element, the pulse of the counter toothing 2 during a rotation of the measuring body and provides a speed output signal representing the motion of the counter toothing 2 and thus the rotation of the toothed disk 1. As discussed with respect to the prior art speed measuring systems, and although the speed sensor 4 is located at an initially selected distance from the toothed disc 1, the actual air gap distance between the speed sensor 4 and the toothed disc 1 will vary with time and with rotation of the toothed disc 1 and the variation in the air gap distance will effect the speed output signal of the speed sensor 4, thereby causing errors in the speed output signal. In another development, as illustrated in Fig. 3, the speed sensor 4 can be designed as double sensor 4A and 4B adjacently located along the direction of motion of the counter toothing 2, thus measuring the direction of rotation and/or angularity thereof, together with the speed of the transmitter wheel.

[032] Axially next to the speed sensor 4 and radially above the cylindrical smooth distance measuring surface 3, a distance sensor 5 is located which scans, for example, according to the inductive or magneto-resistive measuring principle, said distance measuring surface 3. According to the invention, in this manner the distance sensor 5 continuously determines an actual air gap distance between speed sensor 4 and measuring body 1 is constantly determined and provides a distance output signal representing the actual air gap distance between the speed sensor 4 and the measuring body 1. In one other development, a change in the air gap distance between the speed sensor 4 and the measuring body 1 will appear as a change in the distance output signal and,

instead of the actual air gap as represented by the distance output signal, ~~[[the]]~~  
a change in the actual air gap distance as represented by a change in the  
distance output signal change can be used. The actual air gap or the change  
in the actual air gap change a represented by the distance output signal or the  
change in the distance output signal forms, together with the output signal of the  
 speed sensor 4, the input variables of an evaluation device 8 (~~not shown~~) of the  
 inventive speed measuring system. Said evaluation device 8 can be integrated  
 in the speed sensor 4 or in the sensor housing 6, but also in a separate  
 (decentered) control unit 10.

[033] To achieve the most compact construction possible, speed sensor 4 and  
 distance sensor 5 are situated together in one sensor housing 6 thus forming a  
 sort of miniature speed measuring system.

[034] In the evaluation device 8 of the speed measuring system, the ~~actual~~  
 output signal of the speed sensor 4 is evaluated, according to the actual air gap  
distance represented by the distance output signal of the distance sensor 5, ~~and~~  
to form[[s]] an actual speed of the measuring body as represented by an output  
 signal of the speed measuring system. The sensor-specific release thresholds  
 of the speed sensor 4 are here of essential importance, as will be explained  
 herebelow with the aid of Fig. 2.

[035] In Fig. 2 a diagrammatic curve of the speed output signal amplitudes  
 (ordinate A) of the speed sensor 4 ~~[[via]]~~ versus the air gap (abscissa LS)  
 between stationary speed sensor 4 and rotating measuring body 1 is shown.  
 With A\_max and A\_min, respectively, are designated the maximum and  
 minimum speed output signal amplitudes which can result from rotation of the  
 measuring body 1. According to the invention, an upper release threshold S\_o  
 (shown in dotted line) and a lower release threshold S\_u (shown in dotted line)  
 are coordinated with the speed sensor 4. Both release thresholds S\_o and S\_u  
 are a function of the measured air gap LS. If the ~~actual~~ measured speed output  
signal amplitude, that is the magnitude of the speed output signal as provided  
by the speed sensor 4, is greater than the lower release threshold S\_o or smaller  
 than the lower release threshold S\_u, the speed sensor 4 delivers a reliable  
 speed signal unequal to "zero".

[036] The upper and lower release thresholds S\_o, S\_u are stored in the

evaluation device 8 (~~not shown~~) of the inventive measuring system in the form of characteristic lines specific to the sensor and/or specific to the measuring body as a function of the air gap LS. If the speed sensor 4 now detects an actual movement of the measuring body, as represented by the speed output signal of the speed sensor 4, the movement represented by the speed output signal of the speed sensor 4 is corrected by the evaluation device 8 according to the characteristic line representing the actual air gap distance as represented by the distance output signal from the distance sensor 5 and said movement is issued by the evaluation device 8 of the speed measuring system as an actual speed value of the measuring body 1 only when the required signal amplitude, based on the time-parallel measured air gap, has been quantitatively exceeded. Otherwise, the evaluation device of the speed measuring system issues a "zero" speed.

[037] In another embodiment, the maximum and minimum speed signal amplitudes A\_max, A\_min can also be stored in the evaluation device of the speed measuring system in the form of characteristic lines specific to the sensor as a function of the air gap LS. In this embodiment the speed output signal from the speed sensor 4 is corrected by the evaluation device 8 according to the characteristic line representing the actual air gap distance as represented by the distance output signal from the distance sensor 5 and In this variant, the minimum value of the actual speed signal amplitude, dependent on the actual air gap LS, is taken into account, for example, as a differential value in relation to the limiting values A\_max, A\_min of the speed signal amplitudes as a percent deviation from the limiting values A\_max, A\_min of the speed signal amplitudes. The actual speed signal amplitude can then be smaller at most by a defined differential amount or a defined percent deviation than the respective speed signal amplitudes A\_max, A\_min in order that the speed measuring system issues a speed value unequal to "zero".